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TWO REMARKABLE NEW SOUTH AMERICAN SPECIES OF SCHIZOGENIUS PUTZEYS (COLEOPTERA: CARABIDAE).

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Neotropical members of the scaritine genus *Schizogenius* are very poorly understood, and, indeed, it is impossible to recognize many of the described species from their descriptions. Because of inadequate material, to revise them now would be impractical; and isolated descriptions of new taxa without a firm basis for classification certainly would be undesirable. In a proposed revision of North American *Schizogenius*, however, I plan to develop a classification of the genus. Consequently I wish now to provide names for two very aberrant and highly distinctive new species for future reference. These two unrelated South American species are unique in their lack of discal setae on the elytra coupled with possession of short but conspicuous paramedian pronotal sulci.

Measurements were made with an eyepiece micrometer mounted in a stereoscopic microscope at 50 and 150 magnifications, as follows. TL—total length, represented as the sum of the head length from base of eye to antero-lateral angle of clypeus, plus pronotal length (LP) along midline, plus length of left elytron (LE) along suture from base of sutural tubercle to apex. (The LE measurement is the most convenient indication of size.) WH—maximum width of head through eyes. WF—minimum width of frons between eyes. PS—distance from apex of paramedian pronotal sulcus to base of pronotum. WP—maximum width of pronotum. WE—maximum width across both elytra. Ta—length of hind tarsus, excluding claws. Ti—length of hind tibia. The length of the aedeagus (LA) is the straight line distance from the dorsal margin of the basal orifice to the apex.

The habitus drawings were made with the aid of a camera lucida. An ocular grid was used in preparation of the other drawings.

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Schizogenius carinatus Whitehead, NEW SPECIES
(FIGS. 1, 3-7)

The carinate intervals and lack of discal setae on the elytra and the well developed submarginal carinae of the pronotum are sufficient to distinguish this species from all other known *Schizogenius*.

HOLOTYPE. "BRAZIL: Matto Grosso side of Rio Araguaia, Santa Isabel" and "VIII-10 to 20-57, Borys Malkin." To be deposited in the California Academy of Sciences.

DESCRIPTION OF HOLOTYPE. Male (fig. 1). Body cylindrical. Color dark piceus, without metallic luster; antennae, maxillae, labial palpi, legs, apical margin of elytra and apical fourth of sternum six dark testaceus.

Integument. Smooth, shiny. Coarse isodiametric microsculpture limited to median and paramedian fields of clypeus, median field and all paramedian sulci of frons, genae, mentum, submentum and a pair of small paralateral patches on sternum two. Finer microsculpture on the anterior part of gula, a small median patch on prosternum, front legs except posterior surfaces of femora, middle legs, hind legs except coxae and anterior surfaces of femora, sternum one, most of sternum two including median field, sternum three in part and sternum six.

Head. Labrum weakly biemarginate, fringed with six pairs of lateral setae. Clypeus strongly tridentate apically; paramedian carinae straight, convergent on and attaining median tooth; median field triangular, slightly wider at base than greatest width of median field of frons. Clypeal suture deep and sharp behind median field of clypeus. Frons with median field bisected by a low, partly broken, longitudinal carina, not limited in front by a transverse carina; paramedian sulci subequal in width, narrower than median field; frons with five pairs of straight longitudinal carinae, all narrow at base, the first (paramedian) and fourth broader and more strongly elevated, the fifth short but well developed. Eyes large (WF/WH, 0.60), globose, coarsely faceted, the facets all subequal in size. Neck densely and coarsely punctate. Genae strongly rugose. Gula at narrowest point approximately 0.23 width of mentum. Submentum lacking numerous, scattered setae. Mentum deeply incised at middle and with antero-lateral angles of epilobes acutely produced; median tooth small, slender, sharp. Labial palpi with penultimate article bisetose. Antennae (fig. 3) with articles four to ten moderately elongate; scape with a single subapical dorsal seta, ecarinate, lacking a dorsal tubercle; pedicel with a single subapical ventral seta; articles three to eleven pubescent.

Pronotum. Very convex, transverse (LP/WP, 0.87), greatest width near middle. Sides broadly rounded into base, hind angles completely obsolete; sides with only the two standard pairs of setae. Submarginal carinae strongly developed, parallel to sides, extending from apex of pronotum to level of posterior setae. Basal carina strongly elevated above and distant from margin, basal transverse impression sharply discontinuous with marginal grooves. Paramedian sulci short (PS/LP, 0.46), shallow apically, deep and broadly hooked basally where terminated abruptly by forward extensions of basal carina; paralateral sulci absent. Anterior transverse impression punctate.

Legs. Front tarsi strongly dilated and with dense ventral pubescence; middle tarsi moderately dilated; hind tarsi slender, short (Ta/Ti, 0.68). Paronychia conspicuous, about half as long as tarsal claws. Front tibiae (fig. 4) with four evident external teeth, distal tooth nearly straight, penultimate tooth slender and elongate (seta subapical); apical and subapical spurs straight and slender, subequal in length, both shorter than penultimate tooth; front tibiae narrowed evenly to base, where much narrower than at level of subapical spur; posterior ventral margin with three setae proximad to subapical spur. Middle and hind tibiae with apical spurs very slender, very little thicker than other setae.

Elytra. Discal setigerous punctures absent, except one near base of interval three. Striae deep and sharply engraved throughout, finely punctate in basal 2/3. Intervals three to eight conspicuously carinate, the second less so; intervals two to eight all free at apex, interval one attaining margin of elytron. Lateral channel lacking conspicuous subapical pits.

Hind wings. Macropterous, wings probably functional.

Abdomen. Sternum two with median field delimited by a pair of straight, diverging paramedian carinae. Sterna three, four and five each with a single pair of paramedian ambulatory setae. Sternum six with a pair of paramedian ambulatory setae and two pairs of equidistant marginal setae. Pygidium with apical margin entire.

Male genitalia. See figs. 5-7. Median lobe markedly asymmetric (fig. 5), apex of the shaft forming a flange at approximately 45 degrees to left of center; in lateral view (fig. 6) median lobe appears arcuate, apical third not abruptly bent downward. Internal sac (fig. 7) with apical brush large and complex, with distinct but short and slender basal collar spines, and with a well developed and possibly articulated, weakly sclerotized dorsal cap sclerite (which in repose forms a cap over the brush).

Measurements. TL, 3.85 mm. LE, 2.38 mm. WH, 0.81 mm. WP, 1.12 mm. WE, 1.32 mm. LA, 0.73 mm.

VARIATION. Unknown. Female will probably be found to lack paramedian ambulatory setae of sternum six, front tarsi should be more slender and less densely pubescent, and margin of pygidium may be either crenulate or entire.

DISTRIBUTION. *S. carinatus* is known only from the holotype, from central Brazil.

REMARKS. Some characteristics of *S. carinatus* which are absent or infrequent elsewhere in the genus are as follows. 1. The median longitudinal carina and coarse microsculpture of the median field of the frons (found also in certain species of the *riparius-darlingtoni* complex). 2. The strongly raised submarginal carinae of the pronotum (these carinae are also well developed in *S. strigicollis* Putzeys, less so in a few others). 3. The complete loss of hind angles of the pronotum. 4. The carinate elytral intervals (said to pertain also to *S. impressicollis* Putzeys, a species I haven't seen), all of which terminate independently at the apex. 5. The lack of discal setae on the elytra (this condition occurs also in some members of the *optimus-clivinosides-dyschiriooides* complex, and in *S. grossus*, n. sp.).

I am unable to deduce any reasonable interpretation of relationships from these data. I suspect that all of these characteristics are specializations which have probably evolved, independently, more than once. Clearly, however, *S. carinatus* belongs in a group by itself.

Schizogenius grossus Whitehead, NEW SPECIES

(FIGS. 2, 8-13)

The very large size and maculate elytra, the shallow striae and lack of discal setae on the elytra, the presence of ten or more pairs of laterally fringing setae on the labrum, and the reduced pubescence of antennal articles three and four will all serve to separate this species from other known *Schizogenius*.

HOLOTYPE. "Rio Madeira, Brazil. Mann & Baker" and "BROOKLYN MUSEUM COLL 1929." To be deposited in the United States National Museum, USNM 68012.

DESCRIPTION OF HOLOTYPE. Male (fig. 2). Body very stout, subcylindrical. Color dark castaneus, without metallic luster; legs paler; antennae, maxillae, labial palpi and elytra (except for a large, dark castaneus medio-sutural maculation) dark testaceus.

Integument. Smooth, slightly dulled by very weak, imperfectly isodiametric microsculpture. Genae, elytra and abdomen with distinct isodiametric microsculpture, their surfaces strongly dulled. Coarse microsculpture absent from paramedian frontal sulci, and absent from small paralateral patches on sternum two.

Head. Labrum weakly biemarginate, fringed with ten pairs of lateral setae. Clypeus with lateral apical teeth strong and blunt, median tooth subobsolete, margin thus bisinuate; paramedian carinae nearly straight, convergent toward median tooth, obsolete in apical half; median field triangular, width at base more than 1.5 greatest width of median field of frons. Clypeal suture obsolete. Frons with median field smooth, lacking median carina, closed in front by a transverse carina; paramedian sulci decreasing in width outward from median field, the broadest only slightly narrower than median field; frons with four pairs of well-developed longitudinal carinae between eyes, fourth (outer) broader and more strongly elevated, fifth nearly obsolete, second and third bowed outwards at middle, all narrow and somewhat abbreviated at base. Eyes small (WF/WH, 0.75), subglobose, facets all small and equal in size. Neck finely and sparsely punctate at middle, obliquely rugose, and rugae convergent basally. Genae finely rugose in front, smooth behind. Gula at narrowest point approximately 0.09 width of mentum. Submentum lacking numerous, scattered setae. Mentum shallowly incised at middle and with anterolateral angles of epilobes acutely produced; median tooth short, blunt, broad. Labial palpi with penultimate article bisetose. Antennae (fig. 8) with articles four to ten moniliform, slightly transverse; scape with a single subapical dorsal seta, carinate dorsally beyond seta, lacking a dorsal tubercle; pedicel short, with a single submedian ventral seta; articles three and four plurisetose (not pubescent), most of setae short and fringing around apex; articles five to eleven pubescent.

Pronotum. Very convex and transverse (LP/WP, 0.74), greatest width near middle. Hind angles short but sharp, interrupting lateral grooves; side margins broad, sharply emarginate at anterior seta, lobate in front; sides with only the two standard pairs of setae. Submarginal carinae absent. Basal carina moderately elevated above margin, basal transverse impression not continuous with posterior marginal grooves. Paramedian sulci rather short (PS/LP, 0.62), shallow apically, deep and broadly hooked basally where terminated abruptly by forward extensions of basal carina; paralateral sulci absent. Anterior transverse impression shallow and impunctate, but somewhat irregular due to slight rugosity of pronotal disc.

Legs. Front and middle tarsi slender, lacking dense ventral pubescence; hind tarsi slender, very elongate (Ta/Ti, 1.10). Paronychia very short and inconspicuous, subequal in length to basal width of tarsal claws. Front tibiae (fig. 9) with three evident external teeth, distal tooth broadly curved, penultimate tooth short and stout (seta subbasal); apical and subapical spurs straight and slender, both longer than penultimate tooth, subapical spur much longer and subequal in length to distal tooth; front tibiae narrowed evenly to base, where much narrower than at level of subapical spur; posterior ventral margin with four setae proximad to subapical spur. Middle and hind tibiae with apical spurs much thicker than and distinct from other setae.

Elytra. Discal setigerous punctures lacking, except one near base of interval three. Striae shallowly engraved (especially toward apex), finely punctate in basal 2/3. Intervals two to seven moderately convex, eighth narrow but carinate only toward apex; intervals three and five broadly joined with interval seven at apex, interval one attaining margin of elytron. Lateral channel lacking conspicuous subapical pits.

Hind wings. Sternum two with median field limited by a pair of straight, diverging paramedian carinae. Sterna three, four and five each with a single pair of paramedian ambulatory setae. Pygidium with apical margin entire.

Male genitalia. See figs. 10-13. Median lobe nearly symmetric (fig. 10); apical portion of shaft compressed and abruptly bent downward (fig. 12), with paired carinate margins ventro-laterally (figs. 10-11). Internal sac (fig. 13) with apical brush markedly reduced, lacking collar spines or any other evidently enlarged sclerites or enlarged spine-like structures, and also apparently lacking dorsal cap sclerite. (I am not perfectly certain, however, that the internal sac was properly everted; because of very considerable reduction in visibly sclerotized structures, no satisfactory reference point was found.)

Measurements. TL, 7.02 mm. LE, 4.32 mm. WH, 1.80 mm. WP, 2.48 mm. WE, 2.55 mm. LA, 1.32 mm.

ALLOTYPE. "Bolivia Prov. Sara Steinbach" (handwritten) and "Museum of Comparative Zoology." To be deposited in the Museum of Comparative Zoology.

DESCRIPTION OF ALLOTYPE. Female. Specimen lacks outer three articles of left antenna and outer article of right antenna, shows wear or loss of tarsal claws, and is somewhat darkened (due probably to immersion in some fluid). Secondary sexual characters lacking in *S. grossus*, so allotype differs appreciably from the holotype only in mensural characters. Eyes slightly larger (WF/WH, 0.72), pronotum slightly less transverse (LP/WP, 0.75), paramedian pronotal sulci proportionately shorter (PS/LP, 0.60), and hind tarsi slightly shorter (Ta/Ti, 1.07).

Measurements. TL, 6.66 mm. LE, 4.18 mm. WH, 1.62 mm. WP, 2.26 mm. WE, 2.52 mm.

PARATYPES. BOLIVIA: Comatindi (one female); Tiguipa (one female). BRAZIL: Rio Madeira (one male). All of these will be deposited in the United States National Museum.

VARIATION. The chief observed variations are in size (LE, 3.90-4.90, mean 4.44 mm.) and, to a lesser degree, in proportions (WF/WH, 0.69-0.75, mean 0.72; LP/WP, 0.73-0.75, mean 0.74; PS/LP, 0.60-0.68, mean 0.63; Ta/Ti, 1.07-1.12, mean 1.09). Some other variations worthy of record are: male genitalia (see figs. 10-11); size of sutural macula (extends to interval three in male paratype, to interval four in other specimens); fringing setae of labrum (thirteen pairs in the Comatindi specimen); and rugosity of pronotum (quite rugose in allotype and male paratype). Certain secondary sexual characters which frequently are present in other species are not found in *S. grossus*; thus, male front tarsi unmodified, female pygidium entire and both sexes lack paramedian ambulatory setae on sternum six.

DISTRIBUTION. *S. grossus* is represented by the five specimens listed as type material. All are from the Amazon Basin of Bolivia and Brazil.

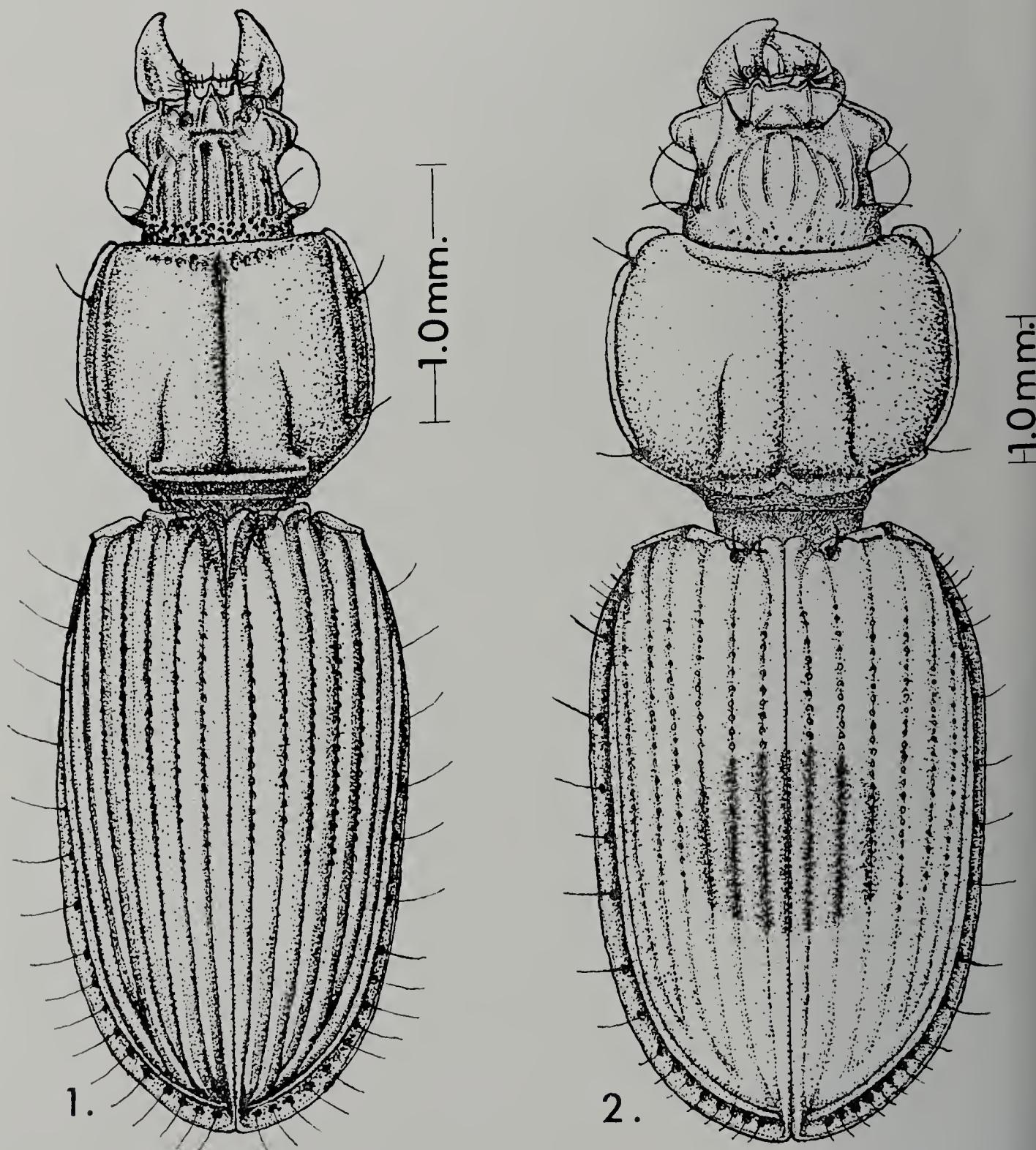
REMARKS. Several characteristics of *S. grossus* are unknown in other *Schizogenius*, as follows. 1. The narrow gula. 2. The sparsely setose third and fourth antennal articles. 3. The shallow emargination of the mentum. 4. The unusually large number of fringing setae of the labrum. 5. The additional (fourth) basal, postero-ventral seta of the front tibiae. 6. The shallow elytral striae. 7. The remarkably elongate tarsi. 8. The reduced apical brush of the male genitalia.

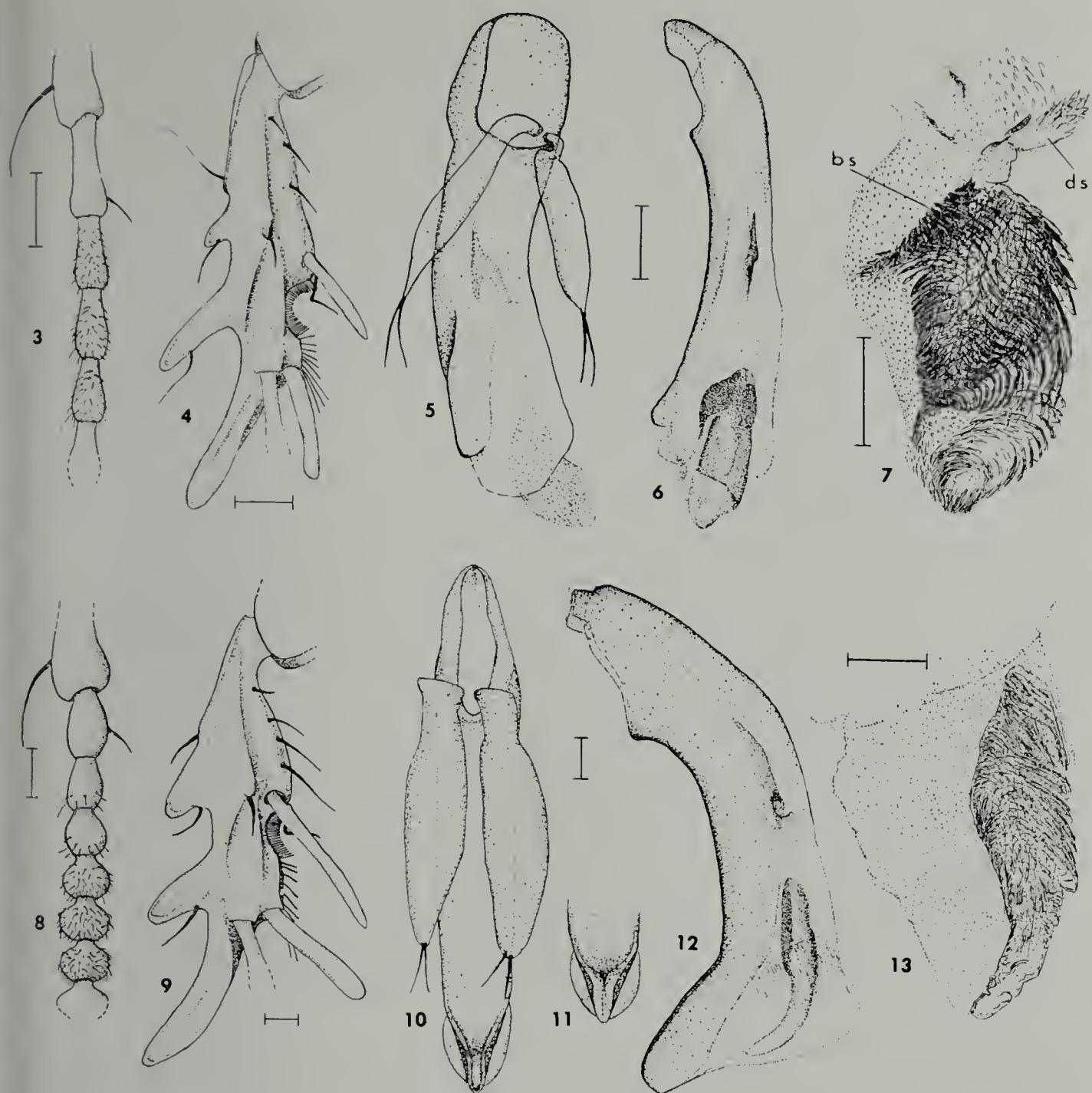
Some affinity with the *optimus-clivinoides-dyschiriooides* complex may be suggested by a general similarity in most other respects, including the absence of secondary sex characters. However, species of that group lack well developed paramedian pronotal sulci, and they have a sharply and deeply emarginate labrum. As in the case of *S. carinatus*, this species is not closely allied with any others and belongs in a group of its own.

S. grossus is the largest known *Schizogenius* (hence its name). Of the next largest species, the relatively slender *S. quadripunctatus* Putzeys from Brazil, only the largest examples (maximum LE, 3.93 mm.) are within the size range of *grossus*. One very large Guatemalan specimen of the heavy-bodied *S. optimus* Bates (LE, 3.76 mm.) is nearly as large as the smallest *S. grossus*, so perhaps they too overlap.

KEY TO MAJOR ELEMENTS OF SCHIZOGENIUS

1. Lateral channel of elytra with one or more deep subapical pits ----- **CRENULATUS-TENUIS-QUINQUESULCATUS COMPLEX**
2. Lateral channel of elytra without deep subapical pits ----- 2
2. Pronotum lacking paramedian longitudinal sulci----- **OPTIMUS-CLIVINOIDES-DYSCHIRIOIDES COMPLEX**
3. Pronotum with deep paramedian longitudinal sulci----- 3
3. Articles three and four of antennae plurisetose----- **GROSSUS** Whitehead
3. Articles three and four of antennae pubescent----- 4
4. Elytral intervals lacking setigerous punctures----- **CARINATUS** Whitehead
4. Elytral intervals three, five and usually seven each with a row of setigerous punctures
(only on interval three in quadripunctatus) -- **REMAINING SPECIES OF SCHIZOGENIUS**

FIGURE 1, *Schizogenius carinatus*. Body, dorsal view.FIGURE 2, *Schizogenius grossus*. Body, dorsal view.



FIGURES 3-7, *Schizogenius carinatus*. 3—Antenna, basal articles. 4—Front tibia, posterior view. 5—Aedoeagus, ventral view. 6—Aedoeagus, lateral view, 7—Internal sac (bs—basal collar spines; ds—dorsal cap sclerite).

FIGURES 8-13, *Schizogenius grossus*. 8—Antenna, basal articles. 9—Front tibia, posterior view. 10—Aedoeagus, ventral view (holotype). 11—Apex of same (paratype). 12—Aedoeagus, lateral view. 13—Internal sac.

(The line scales represent 0.10 mm.)

LITERATURE NOTICE

EXTERNAL CHARACTERS OF SIBLING SPECIES *TRECHUS OBTUSUS* ER. AND *T. QUADRISTRIGATUS* SCHRK. (COLEOPTERA). By P. J. den Boer. *Tijdschr. Ent.* 108(9):219-239, illus. 1965.—Morphological structures are analyzed statistically in these two European species. It seems to be quite thorough.